

XXX.—On Indian Birds' Eggs and their Variations.

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It is only of late years that naturalists have begun to assign much importance to birds' eggs from any point of view. Now, however, it is beginning to dawn on many of them that the colour, the texture, and even the shape of these may have some connexion with, and may assist in determining, the classification of birds. It is therefore very interesting to note all individual differences in birds' eggs and, further, their generic and family variations. The subject, however, opens up so vast a field that it behoves us to take only a very fragmentary portion on which to dilate, otherwise we may wander from the infinite individual variety shown in the Guillemots' eggs to the very startling contrasts shown in those of Cetti's Warbler, and may cover the whole world and yet not make much advance. Here, in India, if we confine our attention to the Passerine birds, ample and interesting work may be found to occupy an indefinite time. If we take up the 'Fauna of British India' (Oates and Blanford) and turn to the very first family, the *Corvidæ*, that is to say the Crows and their nearest allies, we find that Oates has divided it into three subfamilies, containing, firstly, the Ravens, Crows, Magpies, and Nutcrackers, which he unites in the subfamily *Corvinæ*, or typical Crows; secondly, the *Parinæ*, or Titmice; and thirdly, the *Paradoxornithinæ*, or birds which he designates Crow-Tits.

Everyone, of course, knows what a common Indian Crow's egg is like, and we find that in those of the *Corvinæ* there is a strong *family* likeness in all cases. An objector may pick up a Crow's egg and then one of the common Indian Magpie (*Dendrocitta rufa*) and ask wherein the resemblance lies. It *is* there all the same: first let him get a series of these eggs and he will find some more typically Crow-like than others; then let him collect a series belonging to the

* Reprinted from 'The Asian Sporting Newspaper' of October 16th, 1900. With corrections and additions by the Author.

Cissæ, or Green Magpies, and to the *Garruli*, or Jays, and he will find that he can obtain an almost unbroken gradation of colouring from the most typical Crow's egg to the most aberrant one of *Dendrocitta*.

Eggs, therefore, in the *Corvine* bear out the classification obtained by other means.

Next come the *Parine*. In this subfamily the eggs are very characteristic. The colour ranges from a pure white, which is exceptional, to a faint pinkish white densely speckled with red, sometimes so dark as to appear black. In texture the shell is remarkably constant, being smooth, but not highly glossed, and often somewhat porous, while the shape is typically a broad, obtuse oval. This subfamily calls for no remark.

The third subfamily, or *Paradoxornithine*, is by far the most interesting; but, unfortunately, it is also the least known. It contains a number of birds, which in general outward structure are *sui generis*; their most typical characteristic being undoubtedly the bill, which is short and very deep, though variable in these respects. In plumage, and in the structure of the wings and tail, they seem to belong rather to the *Crateropodidæ* than to the *Corvidæ*. Again, in habits—and I am very well acquainted with several members of the constituent genera—the birds are distinctly far nearer to Babblers of some sort than to either Crows or Titmice.

Now let us see what the eggs tell us. First, we are met with the remarkable fact that this subfamily contains birds which lay eggs of absolutely different types. In *Conostoma*, *Paradoxornis*, and *Scæorhynchus* the ground-colour is white or nearly so, in the latter case merely tinted with some shade of yellow, grey, or brown. The markings consist of *indefinite* specks, spots, blotches, and cloudings of grey, sienna-brown, dull purple, and lavender; in some specimens they may be very sparse indeed (I have one of *Paradoxornis flavirostris* which is almost white), in others rather dense, but there is a regular gradation between all the variations. In *Suthora*, the fourth Indian genus of this subfamily, the eggs are in colour like those of the Hedge-Sparrow. Very few of them indeed have been taken, but all yet found, whether in India,

China, or Malaya, have been of this colour, and we must accept it as a fact that they are blue, surprising as it may be. Now none of these eggs bear any resemblance to those of either Tits or Crows,—nor are any of the nests like theirs; on the other hand, they do bear a very strong resemblance to certain eggs of the *Crateropodidae*. Those of the first-named three genera are, in character, shape, and texture, extremely like some laid by the Tit-Babblers, such as Mandelli's Tit-Babbler (*Schæniparus mandellii*), and in character and shape like some belonging to the Yellow-eyed Babblers (*Pyctorhis*).

The lovely blue eggs of *Suthora* are like many Crateropodine eggs, such as those of the White-eyes*.

The nests of the members of all the genera of this subfamily are wonderfully alike, and approach more nearly those of the Babblers than those of the Crows.

We therefore learn that *Scaerhynchus* is nearer *Paradoxornis* than is *Suthora*, and that the position of these two genera in 'The Fauna of British India' should be reversed. Furthermore, the eggs and nests in the subfamily show affinities not to the *Corvidæ*, but to the *Crateropodidae*, and when taken in conjunction with the habits and manners, and in the absence of internal anatomical evidence to the contrary, prove, I think, that it is to the latter family that it must be allied.

The next family is the *Crateropodidae*, a huge series, containing in Oates's book no less than 253 species, while more have since been obtained, bringing the number up to the vast total of 258.

This great mass has been divided into five subfamilies, which we will take one by one. The first is the *Crateropodinae*, which contains the birds known as Laughing Thrushes, Babblers (of the "Seven-sisters" kind), and Scimitar Babblers. Now the characteristic point about the oology of this subfamily is that the eggs are whole-coloured, *i. e.*, they are all white or all blue; but amongst the different genera there is one in which the eggs of certain members are sometimes wholly blue and sometimes spotted, and of

* Mr. Oates places *Zosterops* in his *Crateropodidae*.

others always spotted. I refer to the Laughing Thrushes of the genus *Trochalopteron*, a handsome group of birds usually furnished with fine colour on the wing, in many cases not unlike the speculum of a duck, but of course never metallic.

Now the strongest affinities shown by this genus are undoubtedly to *Garrulax* and *Ianthocincla*, typical Laughing Thrushes, all laying whole-coloured eggs; but, on the other hand, I think, the individual birds show certain characteristics found in members of other subfamilies, notably in *Actinodura*, and less so in *Lioptila* and *Sibia*—all of which genera belong to the subfamily *Brachypterygine*, and lay spotted eggs, yet make nests very similar to those of *Trochalopteron*. We may therefore consider that this genus forms the connecting link between the first subfamily and the others.

If we admit this, it would necessitate the alteration of the order in which the genera are placed by Oates, and they might be arranged thus:—(1) *Xiphorhamphus*, (2) *Pomatorhinus*, and (3) *Ianthocincla*, laying white eggs; (4) *Dryonastes* and (5) *Garrulax*, laying either white or blue eggs; (6) *Argya*, (7) *Crateropus*, (8) *Grammatoptila*, and (9) *Stactocichla*, all laying whole-coloured blue eggs; and finally *Trochalopteron*, the birds of which genus lay either whole-coloured blue eggs or else have them more or less spotted and speckled.

As regards the two genera which lay either white or blue eggs, I can suggest no natural division following the coloration; but future workers on this subject should note that the white-headed Laughing Thrushes not only lay eggs which are white, but which are also totally different in texture and shape from those of any other Laughing Thrushes with the one exception of *Dryonastes galbanus*.

The gloss on the eggs in these two genera varies in extent from intense brilliance in the Rufous-necked Laughing Thrush to comparative dullness in the Necklaced Laughing Thrushes. The smoothness again varies to the same extent, and the porousness of the shell and closeness of texture in

much the same degree. The shells in the white-headed birds, however, are far denser, harder, and more polished, though not so glossy as in some other cases; and the surface, if examined very carefully, will be found to be much pitted, a characteristic which I have noted in no other egg in this subfamily except in that of *Dryonastes galbanus*.

It is very curious to note that both the above-mentioned genera lay two varieties of eggs, as they are naturally linked together by Austen's Laughing Thrush, which itself lays eggs either pure white, or of the distinct yet pale blue of the egg of the Rufous-necked Laughing Thrush.

We are hence led naturally, according to the egg system, into the *Timeliinæ*, the members of which normally lay spotted eggs. Examining this group, we find that there is one genus which does not usually do so, viz. *Stachyris*, which consists (so far as India is concerned) of three little birds, two of which, the Golden Babbler and the Allied Babbler, are practically identical, and the last is the Black-throated Babbler. Now, this genus *Stachyris* formerly contained other species, which lay spotted eggs, but Oates—partly for that reason—formed them into a new genus *Stachyridopsis*. I now find, however, that all the members of the first-named genus sometimes lay spotted eggs also. I have several clutches of those of the Golden Babbler in my collection which are distinctly spotted, in one case almost profusely; and I have also an egg of the Black-throated Babbler which has faintly discernible marks on it (this and one other are the only spotted specimens I have seen among some three or four hundred clutches assigned to the latter bird).

In this genus *Stachyris*, which sometimes lays spotted, though generally pure white eggs, we have the connecting link with the last subfamily.

The third subfamily, *Brachypteryginæ*, is of a rather mixed nature, and contains certain birds the position of which will have to be altered.

Broadly speaking, the eggs in this group are marked in some way, with the exception of those of *Hodgsonius*, *Larvivora*, and the White-eyes (*Zosterops*). The Short-wings (*Brachypteryx*

and *Drymochares*) lay eggs totally different from those of the rest, and they may be roughly described as being pale olive-brown—that is to say, the ground-colour is a pale stone or greenish-grey, almost obliterated by a very fine freckling of some shade of olive-brown. These birds, it has been ascertained, first by Mr. A. G. Cardew as regards *Brachypteryx*, and then by myself as regards *Drymochares*, are Thrushes, the young having the plumage of that family; they have therefore to be eliminated, not only from the subfamily, but from the family *Crateropodidae* altogether.

As regards *Larvivora* and *Hodgsonius* I dare not venture to give an opinion beyond saying that I believe it will eventually be found that they cannot be placed here.

Another genus, *Myiophoneus*, may also have to be placed with the Thrushes. It makes nests and lays eggs much like theirs, but it cannot be said that the young are very Thrush-like.

The fourth subfamily (*Liotrichinae*) contains a heterogeneous assemblage of birds, the majority of which are probably, if not certainly, of this family, but are rather difficult to place with exactitude. All lay spotted eggs except the Fire-cap (*Cephalopyrus*), but beyond this the eggs have little in common. That beautiful genus of rare birds the Shrike-Babblers (*Pteruthius*) shows affinities in some respects to the Crow-Tits and also to birds of many other families. The nests are fragile-looking cradles, pendent as a rule; the eggs are white and sparsely spotted.

The *Ioras* are little green fluffy creatures which rejoice in the distinction of being the only birds that lay eggs marked with pure grey, unmixed with red.

Chloropsis contains the "Green Bulbuls," as they were called in Jerdon's day, and their affinities are all, I believe, with the true Bulbuls; but certain differences may entitle them to be kept apart, and in this case they should, with one or two other genera, form another subfamily. Their eggs, of a very pale pinkish white, are more or less speckled with darker pink and claret-colour, or with a few spots verging upon black; they are distinctly Crateropodine in character.

Melanochlora contains but one species, formerly known as the "Sultan-Tit." The nidification of this bird shows that its former taxonomic position was probably correct; the nest is similar to that of those Tits which build in holes and hollows, and the eggs are true Tits' eggs, and can be very closely matched by many specimens of those of the genus *Machlolophus*. This bird should also, I consider, be withdrawn from the *Liotrichine* and placed in the subfamily *Parinæ*, along with the true Titmice.

Psaroglossa spiloptera has commonly been considered a Starling, and this it undoubtedly is in habits as well as in nidification. The nest is that of a Myna or Starling, and is placed in holes and hollows in trees. The egg is blue and is spotted; in general characters it shows strong affinities to those of the Mynas and the *Eulabetidæ* or Hill-Mynas. This species, also, should be removed from the *Liotrichine* "rubbish hole," and exalted to its former and proper position amongst the *Sturninæ*.

Hypocolius ampelinus is a bird of which I know little, but the observations of Mr. Cumming seem to show that it comes very near the Bulbuls, and hence probably its right place is next to them.

The subfamily *Brachypodinae*, or Bulbuls, is one that calls for no remark, as almost every egg laid by any of the members bears its stamp upon it. All have the ground-colour of some shade of pink, though it is sometimes practically white, and all are marked with shades of red and brown, the predominant colour being red of some kind.

The family *Sittidæ*, or Nuthatches, is a small group containing, in India, only the single genus *Sitta*, while the habits of all the species are alike, and the nidification and eggs practically the same—that is to say, all lay white eggs, more or less spotted with red, in holes of trees or rocks. The main difference of habit is that some reduce the dimensions of the entrances to their nest-holes by means of a mud plaster, and others leave them as found, or enlarge them to suit their own convenience.

The next family, the Drongos or Drongo-Shrikes (*Dicru-*

ridæ), is placed by Oates in an isolated position between the *Sittidæ* and *Certhiidæ*, with neither of which it has any natural connexion. It is probable that the most casual observer, on watching the "King-Crow," as it is popularly termed, would consider it a "Flycatcher," and did he hold it in his hand he would probably call it a Shrike. Many naturalists would agree with the latter view, and in fact the Drongos are generally placed with the Shrikes or close to them. Here again the natural position of the bird is borne out by the nidification and eggs. Certainly the nest of the ordinary King-Crow may not be much like that of the Black-headed or other common Shrike, but let us look a little further afield and see whether we cannot find similar structures built by other acknowledged forms of that group. How about the Cuckoo-Shrikes? Here at once we find nests very similar to those of the King-Crows. How about the fabrics of those lovely little Shrikes, the Minivets? Discard from these a little of the outermost lichen and we have neat and tiny facsimiles of the nests of *Dicrurus*, *Chaptia*, and other forms of the *Dicruridæ*.

This suffices for the nests, and we may turn to the eggs. The Drongos lay eggs which are normally pink, either pale or warm in tint, and are spotted, speckled, and blotched to a variable extent with shades of red and brown. Many of them can be matched in all but size with those of *Lanius nigriceps*, the Black-headed Shrike, and others of the family. The little Bronzed Drongo lays eggs which are sometimes quite undistinguishable from those of Shrikes, and at other times are practically the same as the eggs of the Paradise Flycatcher and its nearest allies. Indeed, it would probably be possible to place on a table three clutches of eggs of the Paradise Flycatcher (*Terpsiphone paradisea*), the Bronzed Drongo (*Chaptia ænea*), and the Bay-backed Shrike (*Lanius vittatus*) respectively, which no one but an expert could tell apart, for, not only in coloration are they similar, but in shape and texture as well.

The family *Certhiidæ*, which, as I have already said, forms the upper half of the Drongo "sandwich," contains the

Creepers and Wrens, and possibly has not many natural affinities to which any weight can be attached. The members lay white eggs, either plain or spotted with red, and one genus of the Wrens (*Anorthura*) varies in this respect.

There are, however, some very remarkable forms in this family which deserve notice, viz., *Salpornis*, *Tichodroma*, and *Sphenocichla*. *Salpornis* will probably prove to be a Creeper. To quote Oates: "But the most remarkable feature about *Salpornis* is that it builds a cup-shaped nest on a branch of a tree, thus deviating entirely from the habits of all other Creepers." The eggs, too, are said to be *greenish-white*, with a zone of blackish specks about the larger end, while some of the marks are sparsely found elsewhere.

Sphenocichla was until recently practically an unknown quantity, but I found its nest in 1899, and the eggs are typical Creepers' eggs, except that they are pure white and huge for the size of the birds.

The *Regulidæ* form a tiny family utilized by Oates for the reception of the Gold-crests, of which there are but four species, the common English form extending to India. Its nest and eggs are typically those of a Wren, and its position, as placed by Oates between the Wrens and Warblers, seems most appropriate.

When we come to the Warblers we are at once introduced to a great number of birds, on the whole far more intimately connected structurally than are the *Crateropodidæ*, yet showing infinite diversity in their nidification and oology, though, as a rule, the various genera lay eggs which may be assigned to their owners without much chance of failure.

To take these in order, we get such eggs as those laid by *Orthotomus*, *Cisticola*, *Franklinia*, *Scotocerca*, *Phyllergates*, and *Suya*, which are spotted (as a rule), and all shew a certain family resemblance, yet may be fairly picked out by their generic distinctions. Then we have the remarkable eggs of the *Horornis* group, including those of *Horeites* and *Neornis*, which may be roughly described as purplish or chocolate.

The *Phylloscopus* group, or "Willow-Warblers" as they are commonly called, may be said to include the beautiful

little "Fly-catcher Warblers," all laying pure white or red-spotted eggs.

But besides these generic groups there are certain genera the members of which lay the most singularly contrasted eggs. Most prominent of all these is undoubtedly *Prinia*, which contains seven species, principally famous for having shorter tails in the summer than in the winter. Now of these seven forms two lay eggs which are coloured brilliant brick-red, while the other five lay blue or blue-green eggs, speckled, spotted, or blotched with dark colours.

The nests, however, are often facsimiles of one another, and the only characteristic at all noticeable in the birds themselves is that, whereas the two "red-egg-layers" are rather brightly-coloured, handsome birds, the others are very plain and inconspicuous.

This family also contains certain birds which lay eggs of a great variety of colours, notably *Orthotomus* and *Franklinia*, but more especially is this the case with the latter. In my own collection I have no less than thirteen varieties laid by *Franklinia*, including pure white and pure blue eggs, with all sorts of tints and spottings. But in no case are the markings bold, and I think that I could always tell an egg of this genus.

To go into greater detail about this family would take up too much space, so we will proceed to the Shrikes (*Laniidae*), which comprise two subfamilies, viz., the true Shrikes (*Laniine*) and the Swallow-Shrikes (*Artamine*). It has already been noted that the Drongos should probably form a third subfamily (*Dicrurine*) of this group, so we will pass on without further remarks on this subject.

The genus *Lanius* is almost world-wide, and everywhere the egg of the Shrike bears its stamp as such. From this genus we pass, by a beautiful gradation in colouring, through the Wood-Shrikes, Cuckoo-Shrikes, and Minivets to the extreme outsider of the group, known as the Great Grey Cuckoo-Shrike or large Cuckoo-Shrike (*Graucalus macii*). This fine species makes a nest very much of the character of that of the Minivets, without the neatness and

the lichen-adornments so much utilized by the latter birds. It lays pale greenish-grey or green eggs, very profusely covered with brown and purple markings of a longitudinal character, the general aspect of the egg being dark green.

The Swallow-Shrikes also lay eggs of a distinctly Shrike-like type, though they vary *inter se* very greatly.

The Orioles (*Oriolidae*), which succeed the Shrikes, but with which they have little, if any, connexion, compose a very well-defined family. They all make similar nests, and lay eggs any one of which would practically serve for that of another species, though distinguishable in some cases by an expert.

After the Orioles, according to Oates, come the *Eulabetidae* and *Sturnidae*, the first containing the Grackles or Hill-Mynas, and the second the true Mynas and Starlings.

The only difference between the two families from an oologist's point of view is that one lays plain blue eggs and the other spotted. Even this, however, is a matter of degree, for the Indian Grackle sometimes lays eggs which are practically unspotted. Very likely these two groups should only be considered as subfamilies of the *Sturnidae*, and, as already mentioned, *Psaroglossa* should be incorporated with the *Eulabetinae*.

The Fly-catchers (*Musicapidae*) are contained in 17 genera, and there is considerable diversity in their eggs, but a gradation, both of colour and tint, can be obtained from one extreme to the other.

Thus green olive-tinted examples in *Cyornis* may be graded into those of *Siphia*, and thence into those of *Stoparola*, *Niltava*, and finally into the pink-spotted eggs of the Paradise Fly-catchers. On the other hand, the specimens in *Cyornis* may be graded into those of *Alseonax*, *Culicicapa*, and *Rhipidura*, but the majority of the genera have the eggs fairly characteristic.

The *Turdidae*, or Thrushes, constitute another very large family divided into various subfamilies, which may be designated Chats (*Saxicolinae*), Redstarts (*Ruticillinae*), True Thrushes (*Turdinae*), Dippers or Water-Ouzels (*Cinclinae*),

and Hedge-Sparrows (*Accentorinæ*). Now the only subdivision which calls for remark is the last but one, viz., the Dippers. Everyone knows what a common Thrush's or Blackbird's egg is like, and to these two types all those of the normal *Turdidæ* bear some relation, the most aberrant being those of certain Bush-Chats and Fork-tails. The Dippers, however, lay pure white eggs, rather long in shape, and of a beautiful, smooth texture. This subfamily should probably be raised to the rank of a family. If we take the other subfamilies in detail we shall find that the only one calling for comment is the *Ruticillinæ*. Here we have a marvellous variety of colouring in the mottled eggs of the Fork-tails, the salmon-coloured of *Notodela*, the blue of *Tarsiger* and others, the olive-brown of the Nightingale, and the green of the Dayal and Shama.

Even here, however, the extremes have some connecting links with one another, and in no case do we find a white, or nearly white, egg.

The family *Ploceidæ* calls for a few remarks. All Indian species of both the subfamilies—Weaver-birds (*Ploceinæ*) and Munias (*Viduinæ*)—lay white eggs, except the genus *Ploceella*, which has them sometimes pure white, but more often greyish or purplish grey in ground-colour, more or less marked with dark shades of brown.

The family *Fringillidæ*, again, may be passed over without comment, the three subfamilies which it contains, viz., the Grosbeaks (*Coccothraustinæ*), the Finches (*Fringillinæ*), and the Buntings (*Emberizinaæ*), all laying eggs very typical of their kind. Nevertheless, in the second subfamily they range from the sparsely-marked Goldfinch's egg to the densely-marked Sparrow's.

The Swallows (*Hirundinidæ*) call for no notice; they lay either white or more or less spotted eggs, while certain forms, such as the Cliff-Swallows, lay eggs which are sometimes of one description and sometimes of the other.

The Wagtails (*Motacillidæ*) and the Larks (*Alaudidæ*) shew their very close connexion with one another in their nidification quite as much as in other respects, and throughout the two families the resemblance of the eggs is very strong.

After these Mr. Oates places the Sun-birds or *Nectariniidae*, which he divides into two subfamilies, the true Sun-birds (*Nectariniæ*) and the Spider-hunters (*Arachnotherinæ*).

In the first group we have birds laying white eggs more or less spotted and marked with grey and brown or reddish-brown. In *Æthopyga* the markings are usually sparse, but in some cases they are fairly dense. In *Arachnethra* they become far more so; indeed some eggs in this genus look very much as if they were of an uniform grey-brown. Now, it is curious that these very nearly approach some eggs of *Arachnothera magna*, the Great Spider-hunter, a bird of the next subfamily; yet the members of that subfamily lay two distinct types of eggs, which have apparently no connexion one with another. The first type ranges in colour from a deep and absolutely uniform chocolate-brown to a less uniform freckly dark grey. This type therefore connects with the other subfamily through *Arachnethra*. On the contrary, the little Spider-hunter (*Arachnothera longirostris*) lays white or pinkish eggs, faintly marked with darker reddish. This type connects with the previous subfamily through the most pink-tinted eggs of the genus *Æthopyga*. Thus we have the members of one subfamily with two totally different types of egg, forming the two extremes of a graded series laid by those of the previous subfamily. This fact, so far as I can ascertain, is quite unique in Indian oology.

The *Pittidæ*, or Pittas, lay typical eggs which cannot well be confounded with those of any other birds; there is little variation among them, and no remarks are necessary.

XXXI.—*The Cage-Birds of Calcutta.* By F. FINN, Deputy Superintendent, Indian Museum, Calcutta.

THE taste for keeping pet birds is a very old one in India, exotic forms, such as Cockatoos, having been imported so long ago as the time of Jehangir, to judge from the representation of a yellow-crested species in a picture dating from the reign of that monarch which I had an